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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/924,698	08/08/2001	Toshihiro Yanagi	70904-56376	2439

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EXAMINER	
BECK, ALEXANDER S	
ART UNIT	**PAPER NUMBER**
2675	

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/924,698	YANAGI ET AL.	
	Examiner	Art Unit	
	Alexander S. Beck	2675	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Acknowledgement is made of the amendment filed by the Applicant on 01/27/2005, in which: the rejection of Claims 1-33 was traversed; Claims 1,9,13,14,16-18,20,23,24 and 29-32 were amended; and new Claims 34-49 were added. **Claims 1-49** are currently pending in US Application Serial No. 09/924,698, and an Office Action on the merits follows.

Information Disclosure Statement

2. The information disclosure statement (IDS) filed on 06/28/2005 has been acknowledged and considered by the examiner. An initialed copy of the PTO-1449 is included in this correspondence.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. **Claims 1-34,38,42 and 46** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujiwara et al. (US 6,052,103 A, hereinafter "Fujiwara) in view of Tasdighi et al. (US 5,734,291 A, hereinafter "Tasdighi").

As to independent **Claim 1**, Fujiwara teaches an active matrix display device that resembles the hold and scanning pattern suggested by the applicant. Fujiwara's invention can best be understood by referring to figure 5 and the description of the figure in column 7, lines 62-65. The figure shows the scan of the display in two distinct modes, a scanning mode (T_W) and a hold mode (T_H), where the hold mode is clearly longer than the scanning mode. Every pixel experiences both scan and hold modes.

Fujiwara however, does not go into specifics of the display power supply. As one skilled in the art understands, portable devices often use charge pumps to achieve different DC/DC voltages. Tasdighi explains in his patent that charge pumps, when switching between high and low power consumption modes, can achieve further power conservation by altering the frequency in which the pumps are driven. More specifically, low power consumption mode is accomplished by reducing the operating frequency of the charge pump (column 1, line 49-50), reducing the output frequency of the oscillator to 1/100 of the normal operating frequency or any other suitable value (column 5, lines 4-13).

As demonstrated by both Fujiwara's and Tasdighi's references, the components necessary to construct the applicant's invention have already been known in the art. Fujiwara's invention could be modified according to resembled the claimed invention by using Tasdighi's

charge pump system as the power supply. Charge pump power supplies are commonly used in portable display device technologies. It would have been obvious to one skilled in the art to combine both methods into the display art, as both methods are conventional, self-sufficient, power saving schemes used by engineers.

As to **Claim 2**, the specifics of the charge pump are described in the Tasdighi reference. Tasdighi explains in column 5, lines 1-4 that charge pumps, to conserve power, are driven at lower frequencies and thus produce less current to the load. Tasdighi states on lines 4-13, to reduce the "output frequency to 1/100... other ratios are also suitable, depending on the expected load during the lower power mode. The low power frequency and the normal operating frequency should be set depending on the particular application." Tasdighi teaches that the specifics of the operational frequency and currents are to be determined according to the load of the device. Lastly on column 7, lines 20-25, Tasdighi teaches the ranges of possible operating current levels.

As to **Claim 3**, Tasdighi teaches the use of an oscillator (figure 1, OSC- item 14) that generates a first clock signal used as a reference in the pump operation of the power supply in scanning mode (column 4, lines 56-62).

As to **Claim 4**, Tasdighi continues to describe in column 4, line 56- column 5, line 5, that the oscillating frequency is modified by a ratio in line 74 by units 16 or 18.

As to **Claims 5 and 6**, figure 6 of Tasdighi shows a different embodiment where two different oscillating circuits are used to produce the desired frequencies controlled by switch 76.

As to **Claim 7**, from figure 5 it can be seen that the scan and hold mode processes are repeated periodically.

As to **Claim 8**, it can be seen from figure 5 that the hold period is considerably longer than the scan period. The multiplication factor, as one skilled in the art understands, is determined in the design process to ensure no loss in display clarity.

As to **Claim 9**, the limitation of having a definite power signal before entering each mode (scanning or hold) is obvious if not inherent to the display art. It would have been obvious to one skilled in the art to know to complete the change of power supply frequency (out of the transient stage), to prepare the signal for use.

As to **Claim 10**, Fujiwara teaches on column 5, lines 45-48 that the mode requires less power consumption than the scanning mode.

As to **Claim 11**, charge pumps can be configured in several different fashions. Tasdighi provides examples of a variety of possible charge pump circuits. The examples cited by Tasdighi do not include regulators, however one skilled in the art understands that regulators are common in charge pump circuits for the purpose of stabilizing a particular voltage signal. Nonetheless Tasdighi shows in figure 7, a rudimentary charge pump that includes a first power supply (Vin) a second power supply (C1) where the control line controls the charge addition of the pump.

As to **Claim 12**, Tasdighi provides examples of a variety of possible charge pump circuits. The examples cited by Tasdighi do not include regulators, however one skilled in the art understands that regulators are common in charge pump circuits for the purpose of stabilizing a particular voltage signal. In figure 4, Tasdighi describes a charge pump capable of inverted voltages (item 58).

As to independent **Claim 13**, the claim is rejected on grounds similar to the rejection of claim 1. Tasdighi states in his disclosure that portable devices require power conservation, a feature that is well understood by ones skilled in the art.

As to independent **Claim 14**, the claim is rejected on grounds similar to the rejection of claim 1. As for the new portion of the claim, it can be seen from figure 7 of Tasdighi that C2 is a smoothing capacitor.

As to **Claim 15**, the claim is rejected on grounds discussed in the rejection of claim 7.

As to **Claim 16**, the claim is rejected on grounds discussed in the rejection of claim 2. As one skilled in the art understand V = IR relation translates to a decrease in voltage output.

As to **Claims 17 and 20**, the limitation of having a definite power signal before entering each mode (scanning or hold) is obvious if not inherent to the display art. It would have been obvious to one skilled in the art to know to complete the change of power supply frequency (out of the transient stage), to prepare the signal for use. As shown from figure 5 of Tasdighi, the transience of the voltage source can be minimized by early preparation of the signal.

As to **Claim 18**, the claim is rejected on grounds discussed in the rejection of claim 2.

As to **Claim 19**, the claim is rejected on grounds discussed in the rejection of claim 8.

As to **Claim 21**, the claim is rejected on grounds discussed in the rejection of claim 10.

As to **Claim 22**, the claim is rejected on grounds discussed in the rejection of claim 11.

As to **Claim 23**, the Claim is rejected on grounds discussed in the rejection of claim 12.

As to independent **Claim 24**, the claim is rejected on grounds discussed in the rejection of claims 13 and 14.

As to **Claims 25-32**, it can be seen from figure 5 that the scanning period is extended to include the holding period.

As to **Claim 33**, the claim is rejected on the grounds presented in the rejection of claim 2, the added limitations of claim 33 not addressed in the rejection of claim 2 is discussed in Tasdighi column 4, lines 61-46 where he states that the oscillator circuit is contingent on the RC values selected.

As to **Claims 34,38,42 and 46**, Fujiwara teaches/suggests in figures 4 and 5 wherein a non-scanning voltage (Vgoff) is output to all scanning signal lines (4) in the hold mode (T_H), so

as to maintain display by means of electric charge stored in a pixel electrode or an auxiliary capacitor (2) of each pixel (column 7, lines 58-67; column 8, lines 25-35).

5. **Claims 35,39,43 and 47** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujiwara and Tasdighi as applied to claims 1,34,13,38,14,42,24 and 46 above, and further in view of Takahashi (US 5,510,916 A, hereinafter "Takahashi").

As to **Claims 35,39,43 and 47**, note the above discussion of Fujiwara and Tasdighi. Fujiwara teaches/suggests wherein an auxiliary capacitor electrode pad (electrode of item 2) and an auxiliary capacitor wire (9) are the auxiliary capacitor (2) (column 7, lines 25-55).

Fujiwara does not disclose expressly wherein an auxiliary capacitor electrode pad and an auxiliary capacitor wire as the auxiliary capacitor are provided on a position where substantially no capacitive coupling with the scanning signal lines occurs.

Takahashi teaches/suggests an active matrix liquid crystal display wherein the elements comprising an auxiliary capacitor are provided on a position of the display where substantially no capacitive coupling with the scanning signal lines occurs (column 7, lines 53-63).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the active matrix image display embodiment of Fujiwara and Tasdighi, such that the auxiliary capacitor and scanning signal lines were positioned as taught/suggested by Takahashi.

The suggestion/motivation for doing so would have been to minimize a coupling capacitance between the auxiliary capacitor and scanning signal lines (column 7, lines 53-63).

6. **Claims 36,37,40,41,44,45,48 and 49** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujiwara, Tasdighi and Takahashi as applied to claims 1,34,35,13,38,39,14,42,43,24,46 and 47 above, and further in view of Kawai et al. (US 6,259,494 B1, hereinafter "Kawai").

As to **Claims 36,40,44 and 48**, none of the previously applied references teach/suggest wherein a part of the auxiliary capacitor wire is paired with the auxiliary capacitor electrode pad with a gate insulating film there between, avoiding the scanning line.

Kawai teaches/suggests in figures 1, 2A and 2B a liquid crystal display wherein a part of the auxiliary capacitor wire (2) is paired with the auxiliary capacitor electrode pad (6) with a gate insulating film (11) there between, avoiding the scanning line (1) (column 5, lines 15-44,45-60; column 6, lines 17-40).

At the time the invention was made, it would have been obvious to further modify the image display embodiment of Fujiwara, Tasdighi and Takahashi, such that a gate insulating film was provided between the auxiliary capacitor wire and the auxiliary capacitor electrode pad, as taught/suggested by Kawai.

The suggestion/motivation for doing so would have been reduce a potential for an interlayer short-circuit, as Kawai teaches that a greater presence of gate insulated film results in a reduced interlayer short-circuit occurrence (column 7, lines 1-5).

As to **Claims 37,41,45 and 49**, Fujiwara teaches/suggests wherein the auxiliary capacitor wire (9) is provided parallel to the scanning signal line (4) (column 7, lines 25-55).

Response to Arguments

7. Applicant's arguments filed 01/27/2005 have been fully considered but they are not persuasive.

Applicant disputes the Examiner's assertion that charge pump power supplies are commonly used in portable display device technologies. Furthermore, Applicant argues that nothing directly disclosed in the art discloses or suggests the use of the charge pump device as a power supply for controlling the internal operation of an active matrix device either in a portable device or otherwise.

Examiner respectfully disagrees. Tasdighi teaches/suggests that a charge pump performing DC-to-DC conversion for providing a voltage to circuitry within a device such as a laptop computer is common (abstract; column 1, lines 10-15). As is known in the art, a laptop computer constitutes a portable display device. Furthermore, it is inherent that a laptop computer comprises an active matrix device with circuitry for controlling the internal operation of said active matrix device by displaying images on a screen through the use of column and row drivers. Therefore, it would have been obvious to a person of ordinary skill in the art that the use of a charge pump for providing a voltage to circuitry within a laptop computer, as disclosed by Tasdighi, would be applicable to an active matrix device for the reasons stated above.

Applicant argues that there is a clear and definite difference between the Fujiwara reference and the currently pending claims with respect to how the display is maintained in the hold mode (i.e., the use of a liquid crystal material in conjunction with an actively controlled leakage current in Fujiwara vs. the utilization of the charge stored in the pixel electrode 3, an

auxiliary capacitor and related components). Specifically, Applicant has cited column 8, lines 50-65 and column 9, lines 9-22 of Fujiwara.

Examiner respectfully disagrees. The citations of Fujiwara, as provided by the Applicant, are descriptive of a "memory mode" in which the display is not changing constantly. When the active matrix driving is not in the memory mode, the display is maintained in the hold mode (T_H) through the utilization of a charge stored in an auxiliary capacitor (2) (column 8, lines 25-35). Furthermore, Fujiwara teaches all limitations of new Claims 34,38,42 and 40, which appear to include the disputed limitations of discussion. For example, Fujiwara teaches/suggests in figures 4 and 5 wherein a non-scanning voltage (Vgoff) is output to all scanning signal lines (4) in the hold mode (T_H), so as to maintain display by means of electric charge stored in a pixel electrode or an auxiliary capacitor (2) of each pixel (column 7, lines 58-67; column 8, lines 25-35).

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Alexander S. Beck** whose telephone number is **(571) 272-7765**. The examiner can normally be reached on M-F, 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Sumati Lefkowitz** can be reached on **(571) 272-3638**. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

asb

SUMATI LEFKOWITZ
SUPERVISORY PATENT EXAMINER